REMARKS

Claims 1-63 are pending in the application. Claims 1-63 have been amended to add the phrase "computer-implemented" at the suggestion of the Examiner. In addition, Claims 20 and 33 have been further amended to correct minor typographical errors. No new matter has been introduced.

Applicants herewith submit formal Figure 3 to correct a minor typographical error. Specifically, "New Inserted Record 106" has been changed to "New Inserted Record 102" to be consistent with "New Inserted Record 102" of Fig. 1 and the specification as originally filed. (*See* Specification, p. 11, line 11). No new matter has been introduced. Acceptance of the new drawing is respectfully requested.

Claims 1-63 have been rejected under 35 U.S.C. § 101. In support of this rejection, the Office Action states the claimed invention is inoperative and therefore lacks utility without specifying what method or system to implement.

In accordance with the Examiner's proposed amendments, Claims 1-63 have now been amended to specify what method or system to implement. The Office Action states Claims 1-32 should include a "computer-implemented method." Similarly, Claims 33-63 should include a "computer-implemented system." Following the Examiner's proposed language, Claims 1-32 and 33-63 have now been amended to recite a "computer-implemented" method or system respectively. No new matter has been introduced. Acceptance is respectfully requested. Accordingly, the rejection under 35 U.S.C. § 101 is believed to be overcome.

Claims 1-18, 24-49 and 55-63 have been rejected under 35 U.S.C. 103(a) as being unpatentable over Cochrane et al. (U.S. Publication 2004/0128289), hereafter "Cochrane" in view of LeCrone et al. (U.S. Patent 6,308,284) hereafter "LeCrone".

The present invention uses respective storage units to control and store a portion of a materialized view that corresponds to an associated portion of a data source. These respective storage units are used, independent of a host controller, to maintain the corresponding portion of the materialized view. Each storage unit may have its own CPU and disk controller, the storage unit can control and maintain its own data without host control. Further, materialized view records contained on the storage units correspond directly to base table records on that same

storage unit. Because data does not have to leave the storage units for updating materialized views from base table records, maintenance of materialized views is greatly simplified, and the network and backplane bottlenecks are avoided. (*See* Specification, p. 3, lines 6 - 14, and p. 5, lines 1 - 15).

Cochrane provides a system for incrementally maintaining non-distributive aggregate functions in a relational database(s). This system uses a processor having a maintenance module to communicate with a data storage device. (*See* Abstract). In turn, this maintenance module is used for incrementally maintaining materialized views of the relational database(s) stored in the data storage devices. (*See* Page 2, [0019]). For example, Fig. 1 shows that a system 10 includes one or more processors 12, 14, 16 that are connected to one or more data storage devices 18, 20, 22, such as disk drives containing one or more relational databases. Each processor 12, 14, 16 includes a maintenance module 24, 26, 28 for incrementally maintaining materialized views of the relational databases stored in the storage devices 18, 20, 22. (*See* Page 2, [0019]). Each processor 12, 14, 16 accesses the storage devices using a standard operator interface and relational database management system. (*See* Page 2, [0020]). The processors do not access the data storage devices without the use of some controller to the data storage devices.

In contrast to the present invention, Cochrane does not disclose a storage unit capable of controlling and storing a portion of a materialized view. Instead, Cochrane uses processor maintenance modules for incrementally maintaining materialized views of relational databases stored in storage devices where the maintenance modules are stored separately from the storage devices. That is, Cochrane's maintenance modules are within processors outside of the storage units. In this way, Cochrane is incapable of controlling and/or storing a portion of the materialized view within a respective storage unit as claimed in the present invention.

In addition, Cochrane also requires the use of a controller, i.e. a host controller, in order for the processors' maintenance modules to communicate to the data storage devices, i.e. a storage data unit, and maintain a materialized view. This is unlike Applicants' claimed invention, which includes *"distributing control of portions of a materialized view to respective storage units, such that each storage unit controls and stores a portion of the materialized view corresponding to an associated portion of the data source*" and *"using the respective storage*

unit, independent of the host controller, maintaining the corresponding portion of the materialized view". See base Claims 1 and 33.

LeCrone, like Cochrane, does not disclose a storage unit controlling and storing respective portions of a materialized view corresponding to an associated portion of a data source. In addition, Lecrone is also unable to maintain a materialized view independent of a host controller. Instead, LeCrone is directed to assuring data consistency in a data processing network and using a remote host to interact with remote storage controllers.

Briefly, LeCrone provides a method and apparatus for assuring data consistency in a data processing network including local and remote data storage controllers interconnected by independent communication paths. The remote storage controller or controllers normally act as a mirror for the local storage controller or controllers. If, for any reason, transfers over one of the independent communication paths is interrupted, transfers over all the independent communication paths to predefined devices in a group are suspended thereby assuring the consistency of the data at the remote storage controller or controllers. (*See* Abstract). For example, the consistency of data is managed by using remote hosts 28 and 29 that are connected to communicate with both remote storage controllers 24 and 27. As the communications paths 25 and 26 can extend for many miles a disaster at the local facility will not interrupt operations at the remote facility whereupon the remote hosts 28 and 29 interact with the data in the remote storage controllers 24 and 27. (*See* Col. 5, line 64 - Col. 6, line 3).

In contrast to the present invention, LeCrone discloses a way to mirror remote storage controllers to ensure data accuracy. Further, as disclosed by LeCrone, any interaction with a data storage device is done through the storage controller via the a remote host. Thus, LeCrone does not provide a means of a data storage unit to control and/or store a portion of a materialized view nor does LeCrone provide a way of maintaining a materialized view independent of a host controller. In fact by design, LeCrone, is a data accuracy method and is not intended to control and store a portion of a materialized view. This is unlike Applicants' claimed invention, which includes *"distributing control of portions of a materialized view to respective storage units, such that each storage unit controls and stores a portion of the materialized view corresponding to an associated portion of the data source*" and *"using the respective storage unit, independent of the*

host controller, maintaining the corresponding portion of the materialized view". Such is recited in base Claims 1 and 33.

Neither Cochrane nor LeCrone individually or in any combination imply, suggest or make obvious the claimed method or system for *"distributing control of portions of a materialized view to respective storage units, such that each storage unit controls and stores a portion of the materialized view corresponding to an associated portion of the data source*" or *"using the respective storage unit, independent of the host controller, maintaining the corresponding portion of the materialized view*" as claimed in base Claim 1. Independent base Claim 33 has similar limitations. Dependent Claims 2-32 and 34-63 inherit these limitations from respective base claims. Thus, the § 103 rejection of Claims 1-18, 24-49 and 55-63 using Cochrane in view of LeCrone is believed to be overcome. Acceptance is respectfully requested.

Claims 19-23 and 50-54 have been rejected under 35 U.S.C. 103(a) as being unpatentable over Cochrane in view of LeCrone, as applied to Claims 1 and 33 above, and further in view of Okada et al. (U.S. Publication 2002/0040413) hereafter "Okada".

Okada provides a storage controlling apparatus capable of performing a software-unassisted compression by controlling a disk storage device. (*See* Page 1, [0020]). Okada does not add to Cochrane and LeCrone the missing claim features of *"distributing control of portions of a materialized view to respective storage units, such that each storage unit controls and stores a portion of the materialized view corresponding to an associated portion of the data source*" or *"using the respective storage unit, independent of the host controller, maintaining the corresponding portion of the materialized view.*" as claimed in base Claim 1. Independent base Claim 33 has similar limitations.

Thus, no combination of Cochrane, LeCrone and/or Okada imply, suggest or make obvious the claimed process or system as claimed in base Claim 1. Base Claim 33 has similar limitations. Claims 19-23 depend from base Claim 1 and Claims 50-54 depend from base Claim 33 and thus inherit these claim limitations. Thus, the § 103 rejection of Claims 19-23 and 50-54 as being unpatentable over Cochrane in view of LeCrone, as applied to Claims 1 and 33 above, and further in view of Okada is believed to be overcome. Acceptance is respectfully requested.

CONCLUSION

In view of the above amendments and remarks, it is believed that all claims are in condition for allowance, and it is respectfully requested that the application be passed to issue. If the Examiner feels that a telephone conference would expedite prosecution of this case, the Examiner is invited to call the undersigned.

Respectfully submitted,

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Amendment to the Drawings

A replacement Figure 3 is being submitted herewith to correct a minor typographical error as indicated in red on the accompanying annotated Fig. 3.

Attachments: Replacement Sheet
Annotated Marked-Up Drawing

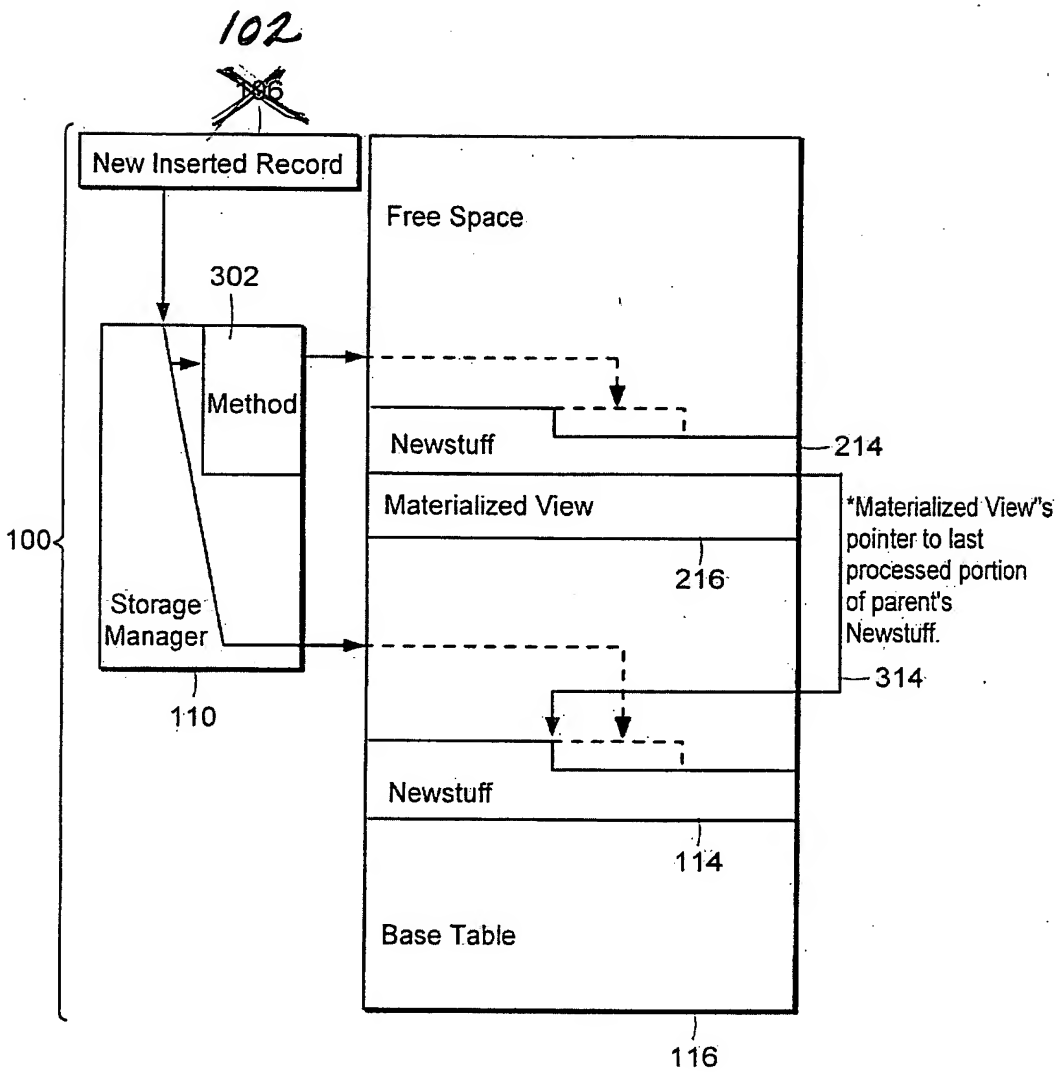
102
New Inserted Record
Free Space
302
Method
Newstuff
214
Materialized View
*Materialized View"s pointer to last processed portion of parent's Newstuff.
100
216
Storage Manager
314
110
Newstuff
114
Base Table
116

FIG. 3